

## WHAT IS CLAIMED IS:

1. A pump lid assembly for a container, the lid assembly comprising:
  - (a) a seat-portion for sealing connection to the container;
  - (b) a pump configuration associated with said seat-portion and configured with a pumping element actuated in a reciprocating linear motion to pump gas from within the container to an external atmosphere; and
  - (c) a rotatable actuating element mechanically associated with said pump configuration such that continuous rotation of said actuating element in a given rotational direction generates said reciprocating linear motion of said pumping element, thereby pumping a quantity of gas through the pump configuration thereby generating a pressure differential within the container.
2. The lid assembly of claim 1, wherein said actuating element substantially circumscribes at least a portion of said pump configuration such that said continuous rotation is about said pump configuration.
3. The lid assembly of claim 2, wherein one of said pumping element and said actuating element includes a longitudinally-wave-like groove, and the other of said pumping element and said actuating element includes at least one pump activation pin configured to engage said wave-like groove, such that during said continuous rotation said activation pin contacts an edge of said longitudinally-wave-like groove, thereby generating said reciprocating linear motion
4. The lid assembly of claim 3, wherein said pumping element is a substantially cylindrical piston element, an outer surface of which is a circumferential wall configured with said groove circumscribing said wall so as to form a single continuous groove; and said actuating element includes said at least one pump activation pin.

5. The lid assembly of claim 1, further including a contents-dispensing mechanism for removing non-gaseous contents from the container while maintaining said pressure differential.

6. The lid assembly of claim 5, wherein said contents-dispensing mechanism includes a rotatable dispensing element deployed in said seat-portion, said dispensing element configured with a contents receptacle, and said dispensing element rotatable such that said contents receptacle is alternately alignable with a contents inlet, opening into said interior volume, and a contents outlet, opening to said exterior atmosphere, said contents inlet and said contents outlet being spaced apart such that as said contents receptacle alternates between said contents inlet and said contents outlet said contents receptacle passes through a region in which fluid communication between said contents receptacle and one of said contents inlet and said contents outlet is fully interrupted before fluid communication is established with an other of contents inlet and said contents outlet.

7. The lid assembly of claim 1, further including a ratchet mechanism to limit rotation of said actuating element to said given rotational direction.

8. The lid assembly of claim 1, further including a lid-removal mechanism configured to selectively limit rotation of said actuating-ring in relation to said seat-portion.

9. The lid assembly of claim 8, wherein said lid-removal mechanism is engaged by displacing said actuating element a pre-limited distance in a direction longitudinally away from the container and displacing at least a portion of said actuating element inward toward said seat-portion so as to engage complementary teeth configured in both the actuating element and said seat-portion.

10. The lid assembly of claim 1, further including a pressure differential indicator.

11. The lid assembly of claim 10, wherein said pressure differential indicator is configured as a passage with at least one opening to said interior volume of the container and at least one opening to said exterior atmosphere, said opening to said exterior atmosphere being closed by a pressure indicating element that is displaceable between two different states so as to indicate pressure differential and non-pressure differential states within said interior of the container.

12. The lid assembly of claim 11, wherein said pressure differential indicating element is configured from resilient material biased to a first state, so as to indicate said non-pressure differential state, and displaceable to a second state, so as to indicate said pressure differential state.

13. The lid assembly of claim 1, wherein said pump configuration includes at least one one-way inlet valve and at least one one-way outlet valve.

14. The lid assembly of claim 13, further including a filter element associated with said one one-way inlet valve.

15. The lid assembly of claim 1, wherein said pumping element and said rotatable actuating element are configured as a single element such that said continuous rotation includes rotation of both said actuating element and said pumping element, and said reciprocating linear motion includes reciprocating linear motion of both said pumping element and said actuating element.

16. A lid assembly for removing contents from a container in which a pressure differential has been created while maintaining the pressure differential in the container, the lid assembly comprising:

- (a) a seat portion configured for attaching the lid assembly to the container;
- (b) a contents inlet configured in said set-portion, said contents inlet opening into an interior volume of the container;

- (c) a contents outlet configured in said seat-portion, said contents outlet opening to a exterior atmosphere of the container;
- (d) a rotatable dispensing element deployed in said seat-portion; and
- (e) a contents receptacle configured in said dispensing element, said dispensing element rotatable such that said contents receptacle is alternately alignable with said contents inlet and said contents outlet;

wherein said contents inlet and said contents outlet are spaced apart such that as said contents receptacle alternates between said contents inlet and said contents outlet said contents receptacle passes through a region in which fluid communication between said contents receptacle and one of said contents inlet and said contents outlet is fully interrupted before fluid communication is established with an other of contents inlet and said contents outlet.

17. The lid assembly of claim 16, wherein said rotatable dispensing element is actuated by a rotatable shaft manipulated from an exterior of said seat-portion.

18. The lid assembly of claim 16, wherein said rotatable dispensing element is configured as a substantially spherical element.

19. A screw on lid assembly for a container, the lid assembly configured to selectively limit removal of the lid assembly from the container, the lid assembly comprising:

- (a) a seat-portion for attaching the lid assembly to the container, said seat-portion including a substantially cylindrical lid body; and
- (b) a rotating actuating ring rotatably attached to said seat-portion so as to circumscribe said cylindrical body, at least a portion of said actuating ring configured as a locking tab being displaceable between a normal free-rotation position, in which said actuating-ring is free to rotate in relation to said seat-portion, and a locked non-rotation position, in which the position of said actuating-ring is locked in relation to said seat-portion;

wherein said locked position is engaged by displacing said actuating-ring a pre-determined distance in a direction longitudinally away from the container and

displacing said locking tab inward toward said seat-portion so as to engage complementary teeth configured in both the actuating-ring and the seat-portion.

20. A lid assembly for creating a pressure differential within a container, the lid assembly comprising:

- (a) a seat-portion for sealing connection to the container;
- (b) a pump configuration associated with said seat-portion; and
- (c) a rotatable actuating element mechanically associated with said pump configuration, said rotatable actuating element configured with a pumping element actuated in a reciprocating linear motion to pump gas through said pump configuration, such that continuous rotation of said actuating element in a given rotational direction rotates both said rotatable actuating element and said pumping element and generates said reciprocating linear motion of said pumping element and said rotatable actuating element, thereby pumping gas through said pump configuration to generate a pressure differential.

21. The lid assembly of claim 20, wherein at least a portion of said actuating element substantially circumscribes at least a portion of said pump configuration.

22. The lid assembly of claim 21, wherein one of said pump configuration and said actuating element includes a longitudinally-wave-like groove, and the other of said pump configuration and said actuating element includes at least one pump activation pin configured to engage said wave-like groove, such that during said continuous rotation said activation pin contacts an edge of said longitudinally-wave-like groove, thereby generating said reciprocating linear motion

23. The lid assembly of claim 22, wherein said pump configuration includes a pump cylinder configured to accept said pumping element, a substantially cylindrical outer surface of said pump cylinder is a circumferential wall configured with said groove circumscribing said wall so as to form a single continuous groove; and said actuating element includes said at least one pump activation pin.



24. The lid assembly of claim 20, further including a contents-dispensing mechanism for removing non-gaseous contents from the container while maintaining said pressure differential.

25. The lid assembly of claim 24, wherein said contents-dispensing mechanism includes a rotatable dispensing element deployed in said seat-portion, said dispensing element configured with a contents receptacle, and said dispensing element rotatable such that said contents receptacle is alternately alignable with a contents inlet, opening into said interior volume, and a contents outlet, opening to said exterior atmosphere, said contents inlet and said contents outlet being spaced apart such that as said contents receptacle alternates between said contents inlet and said contents outlet said contents receptacle passes through a region in which fluid communication between said contents receptacle and one of said contents inlet and said contents outlet is fully interrupted before fluid communication is established with an other of contents inlet and said contents outlet.

26. The lid assembly of claim 20, further including a ratchet mechanism to limit rotation of said actuating element to said given rotational direction.

27. The lid assembly of claim 20, further including a lid-removal mechanism configured to selectively limit rotation of said actuating-ring in relation to said seat-portion.

28. The lid assembly of claim 27, wherein said lid-removal mechanism is engaged by displacing said actuating element a pre-limited distance in a direction longitudinally away from the container and displacing at least a portion of said actuating element inward toward said seat-portion so as to engage complementary teeth configured in both the actuating element and said seat-portion.

29. The lid assembly of claim 20, further including a pressure differential indicator.

30. The lid assembly of claim 29, wherein said pressure differential indicator is configured as a passage with at least one opening to said interior volume of the container and at least one opening to said exterior atmosphere, said opening to said exterior atmosphere being closed by a pressure differential indicating element that is displaceable between two different states so as to indicate pressure differential and non-pressure differential states within said interior of the container.

31. The lid assembly of claim 30, wherein said pressure differential indicating element is configured from resilient material biased to a first state, so as to indicate said non-pressure differential state, and displaceable to a second state, so as to indicate said pressure differential state.

32. The lid assembly of claim 20, wherein said pump configuration includes at least one one-way inlet valve and at least one one-way outlet valve.

33. The lid assembly of claim 32, further including a filter element associated with said one one-way inlet valve.